6.0
Natural Resources Program Overview

6.1 BIODIVERSITY CONSERVATION

Human development in the United States and resulting changes in the landscape are causing the number and variety of species to decline. The Department of Defense manages 25 million acres of public land within the United States, which is among the most important of all federal land holdings based on wealth of natural biological resources. In many instances the lands and waters upon which the Army, Navy, Air Force and Marine Corps have trained and operated for decades represent important ecological assets because of their pristine quality, natural diversity, and sheer beauty. Biodiversity, expressed through the variety and variability among living organisms and their environments, has a major influence on the stability and sustainability of natural systems.

6.1.1 What Is Biodiversity?

There are many definitions of biodiversity. One definition as presented in *Conserving Biodiversity on Military Lands* (Leslie, 1996), is "the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting." As stated in this publication, the easiest way of thinking about biodiversity is simply as "the variety of life and its processes."

There are two aspects of biodiversity that are critical, but frequently overlooked or misunderstood. First, biodiversity is not the same as the number of different kinds of species in a given area; i.e., biodiversity does not equal species richness. Biodiversity is more complex than species richness. Although species richness is certainly one component, biodiversity should be thought of consisting of the following three additional components:

- **Genetic diversity** exists at three levels: genetic variation within a single individual, genetic differences among individuals within a population, and genetic differences among populations.

- **Ecosystem Diversity** refers to the variety of ecosystems across the landscape. An ecosystem is the collection of all living things, plus the non-living environment, within a specific place at a particular time.

- **Landscape Diversity** refers to variation among the ecosystems that interact across a large land area.

The second critical aspect is that biodiversity is not just objects (e.g., animals, rocks). Consequently, biodiversity is not a static condition. Biodiversity depends upon and includes dynamic processes, as well as the objects within the ecosystem. These processes include, but are

not limited to, biogeochemical cycles; biotic and abiotic disturbances; predator-prey, mutualistic, or parasitic relationships; migrations; and competitive effects (Leslie, 1996).

Biodiversity has a major influence on the stability and sustainability of natural systems. Healthy ecosystems provide essential benefits to society. The natural environment serves as the source of foods, fuel, fibers, and many medicines. The natural environment also provides genetic material to ensure the long-term viability of crop plants and sources of new life-saving medicines. Biological communities have an indirect economic value. They "are important in maintaining the chemical quality of natural waters, in buffering ecosystems against floods and droughts, in protecting and maintaining soils, in regulating climate and in breaking down organic and inorganic wastes." (Begon et al, 1996). Beyond these utilitarian values, Americans value healthy natural areas as an invaluable part of their natural heritage.

6.1.2 What Is Biodiversity Conservation?

Conservation of biodiversity takes into account not only the living things, but also the setting within which they occur, and the forces and processes acting on them. The ultimate aim of biodiversity conservation is to prevent extinctions of species and communities at local and regional levels, as well as globally.

6.1.3 DoD's Role in Biodiversity Conservation

In terms of acreage managed, DoD is the fifth largest federal land manager (Leslie, 1996). Although DoD-managed lands represent only 3 % of the total federal land inventory, there is strong evidence that they have disproportionately high value in terms of biodiversity. DoD reported more than 220 federally listed species as confirmed residents on or migrants through military lands. The Natural Heritage Data Network includes reports of almost 100 of these species for DoD, which is roughly comparable to the total species numbers reported for each of the other major federal landholders (the U.S. Forest Service, Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service each have federally listed species totals between 50 and 150).[1] When plotted against the total number of acres held by each agency, the number of listed species on DoD lands is disproportionately great (Leslie, 1996).

DoD recognizes that biodiversity conservation is the foundation of sensible military natural resources management because it accomplishes the following:

- Maintains natural landscapes for realistic military training, today and in the future
- Keeps DoD in compliance with the Endangered Species Act and other environmental laws

[1] The difference between DoD reporting and Natural Heritage Data Center Network reporting is because data centers may not be aware of all occurrences, may have a data entry backlog, may not have completely recorded the land ownerships for their occurrence records, and generally do not record species and species occurrences in lakes and rivers as under the jurisdiction of a federal agency.

- Contributes to national security by helping maintain the natural resources upon which this country's strength depends

- Provides a public relations benefit because Americans want good stewardship of their natural resources

- Enhances quality of life for military personnel.

6.1.4 DoD's Policy on Biodiversity Conservation

DoD's 1994 *Ecosystem Management Policy Directive* issued by the Deputy Undersecretary of Defense for Environmental Security articulates the biodiversity conservation policy embraced by the DoD and the military departments. The directive establishes that the goal of DoD's biodiversity conservation policy is to "maintain and improve the sustainability and native biological diversity of terrestrial and aquatic, including marine, ecosystems while supporting human needs, including the DoD mission."

DoD's *Ecosystem Management Policy Directive* incorporates five major management themes:

- **Ecological Approach**. DoD will continue to shift its focus from protection of individual species to management of ecosystems.

- **Partnerships**. DoD will form partnerships to achieve shared goals.

- **Participation**. Public involvement, communication, and incorporation of public needs and desires into management decisions will be emphasized.

- **Information**. The best available scientific and field-tested information will be used in making decisions and selecting the most appropriate technologies in management of natural resources.

- **Adaptive Management**. Natural resources managers will incrementally implement adaptive management techniques as they become known through the dynamic process of applying the best available scientific data and methodologies.

DoD Instruction 4715.3, *Environmental Conservation Program* and Army Regulation 200-3, *Natural Resources – Land, Forest, and Wildlife* are the primary natural resources management guidance documents for military installations. The DoD instruction was developed to provide guidance to DoD natural resources managers on how to implement DoD's *Ecosystem Management Policy Directive*. The instruction states that "all DoD's conservation programs shall work to guarantee continued access to our land, air, and water resources for realistic military training and testing while ensuring that the natural and cultural resources entrusted to DoD care are sustained in a healthy condition for scientific research, education, and other compatible uses by future generations." The instruction establishes specific management tactics to achieve conservation goals:

- Maintain or restore remaining native ecosystem types across their natural range of variation.

- Maintain or reestablish viable populations of all native species in areas of natural habitat, where practicable.
- Maintain evolutionary and ecological processes, such as disturbance regimes, hydrological processes, and nutrient cycles.
- Manage over sufficiently long periods to allow for changing system dynamics.
- Plan to accommodate human use as necessary.

AR 200-3 was developed to set forth policy, procedures, and responsibilities for the conservation, management, and restoration of installation lands and their associated natural resources, consistent with the military mission and in consonance with national natural resources management policies. The regulation states, "It is the Army's goal to systematically conserve biological diversity on Army lands within the context of its mission. The Army recognizes that natural ecosystems play a vital role in maintaining a healthy environment. Natural ecosystems can best be maintained by protecting the biological diversity of native organisms and the ecological processes that they perform and are part of. Habitat management is the key to effective conservation of biological diversity and the protection of listed species."

6.1.5 Importance of Biodiversity Conservation to Installations

Despite its past accomplishments in natural resources conservation, the military faces increasingly difficult land management challenges. Projected changes to weapons systems, fighting and peacekeeping strategies, and operations put increased demands on military lands. With base realignments and closures, the military must satisfy these new requirements with diminishing land resources. Complicating this challenge is the influence of continuing development, especially urbanization, outside the boundaries of military installations. As population growth and urban expansion continue, native species, biological communities, and the ecological processes that sustain them will experience additional pressures. Degrading of landscapes, both on and off installations, will make compliance with environmental permits and implementation of mitigation measures more difficult. These growing pressures are likely to increase the public and regulator focus on stewardship of military lands.

6.2 IMPLEMENTING BIODIVERSITY CONSERVATION

6.2.1 The Ecosystem Approach

Biodiversity conservation is best accomplished when undertaken on an ecosystem basis. An ecosystem-based approach to natural resources management takes a regional view of management, considering that ecosystem boundaries extend beyond installation boundaries — hence the need for partnering and outreach.

The features of ecosystem-based management, as presented in *Conserving Biodiversity on Military Lands* (Leslie, 1996) include the following:

- Focuses on systems rather than single-species
- Establishes multiple-management objectives (e.g., habitat, watersheds), rather than commodity-based objectives (e.g., timber, game species)
- Strives for a naturally maintained system, rather than human maintenance
- Addresses causative agents of problems, rather than symptoms
- Accommodates uncertainties, rather than trying to eliminate them
- Addresses ecological boundaries, rather than political boundaries
- Incorporates long-term thinking to supplement short-term views
- Monitors, and change management approaches as necessary.

6.3 BIODIVERSITY CONSERVATION AT FORT BELVOIR

6.3.1 Management Philosophy

Fort Belvoir fully embraces biodiversity conservation, and has developed and implemented an ecosystem-based natural resources management program. The installation does not emphasize single-species management[2]. However, neither does it aim to increase the number of species or number of communities on post. Consistent with the principles of ecosystem management, Fort Belvoir aims for preserving the native diversity of communities and the native diversity of species within communities. Fort Belvoir recognizes that it will conserve the greatest biodiversity if it focuses management efforts at the community level.

The following summarizes Fort Belvoir's management considerations regarding biodiversity conservation:

- Fort Belvoir's 9,094 acres (including the 581 acres owned by the Humphreys Engineer Center), is relatively small when compared with ecosystem boundaries that extend far beyond the installation's boundaries. Because of this, Fort Belvoir must take a regional view and involve outside partners/participants in its management program.
- Fort Belvoir's on-post natural habitat areas already exist as fragments within the larger ecosystem area. Other fragments of natural habitat within the area include Huntley

[2] There are specific instances where single-species management is appropriate. For example, compliance with the Endangered Species Act requires management actions for individual listed species.

Meadows Park to the north and the Mason Neck State Park and the Potomac River National Wildlife Refuge Complex to the south (Figure 2.4). Taken together, these fragments represent a complex of the largest continuous and most diverse habitat area in Eastern Fairfax County. Fort Belvoir recognizes that the ecological function of this larger habitat complex depends upon conservation on Fort Belvoir's component piece. Preservation of the size and continuity of on-post natural habitat is the single most important management tool for maintaining native diversity both within Fort Belvoir and within the broader eastern Fairfax County area.

- Fort Belvoir has completed baseline natural resource surveys (Sections 7 to 12). While the resources have been fairly well inventoried, the natural processes to which they are subject (e.g., nutrient cycling, hydrologic cycle) have not been characterized. Aiming to "restore" a community is difficult because there is not sufficient knowledge about the community. Consequently, Fort Belvoir must assume that its current level of biodiversity, based on existing surveys, is the appropriate level, and all management efforts will be focused on maintaining the current level of biodiversity. Nonetheless, Fort Belvoir must be prepared to change management strategies to accommodate new information as it becomes available.

- Change/variation is inevitable and natural. The installation's natural resources management program needs to allow for naturally occurring change and the processes that cause change. However, Fort Belvoir recognizes that there may be situations where it may be ecologically beneficial to alter/intervene with naturally occurring changes (e.g. succession) these will be considered on a case-by-case basis.

- In the urban landscape of Northern Virginia, humans are a large part of the landscape, both on-post and off-post. Therefore, human activities must be integrated into the landscape in a way that does not degrade the existing environment.

- Management funds and resources are limited, so Fort Belvoir must manage natural resources in the most cost-effective method with a regional approach.

6.3.2 Fort Belvoir Natural Resources Program Vision and Mission Statements

Fort Belvoir's Natural Resources Program vision and mission statements are as follows:

Natural Resources Program Vision Statement
Fort Belvoir's vision for the natural resources program is to manage natural resources using sound ecological principles in an appropriate landscape context (e.g., local, regional, and national), and to continue to provide opportunities for future generations to access and use these resources, consistent with resource conservation. The program will integrate local, regional, and national ecological initiatives that are appropriate to the military mission. The program will be built on a core natural resources team comprised of professionally trained, multi-disciplinary, experienced staff, supported by properly trained and experienced experts and partners. The program will have inherent flexibility to support future changes in mission or the regulatory environment.

Natural Resources Program Mission Statement
The mission of the natural resources program is to manage natural resources as an integral part of Fort Belvoir's military mission. As the guardian of public lands, it is the mission of the natural resources program to maintain the existing level of biodiversity using sound ecological principles to ensure that economic and aesthetic values of public lands are maintained. The program's mission involves ensuring installation compliance with natural resources laws and regulations, as well as providing public access and customer service support to base operations, tenants, military personnel and their families, the research and education community, and the general public.

6.3.3 Fort Belvoir Natural Resources Management Program Goals

The Fort Belvoir natural resources program conserves and protects biodiversity using an ecosystem management approach. Baseline surveys of each resource area (e.g., water resources, wetlands, etc.) were conducted to characterize the resources on-post and to assess their significance. Conservation goals were then established and prioritized so that management strategies could be developed and implemented. These goals are supported by specific resource objectives and actions outlined in Section 7 to 13. They are presented below in no order of importance.

Program Goal 1. Ensure compliance of installation actions with federal, state, regional, and local statutes, regulations, and policies applicable to natural resources.

Program Goal 2. Manage Fort Belvoir lands to provide balanced, multiple-use opportunities (e.g., military training and testing, environmental education, scientific research and study, low-intensity recreation) without degradation of natural resources in accordance with DoDI 4715.3, *Environmental Conservation*.

Program Goal 3. Provide natural resource customer service to military training and testing activities, base operations, tenants, military personnel and their families, the research and education community, and the general public that meet their expectations and demands for quality in accordance with the *Fort Belvoir Strategic Plan* (U.S. Army, 2000f).

Program Goal 4. Ensure natural resources stewardship by protecting against loss or degradation of native habitat conditions, and protecting against loss of native biological diversity and structure within native communities.

6.3.4 Fort Belvoir's Natural Resources Management Program Methodology

Fort Belvoir follows a regional ecosystem-based approach to natural resources management. This approach requires that Fort Belvoir set management goals and objectives that are both appropriate for the ecological setting, and that are consistent with established conservation initiatives.

The ecosystem approach to natural resources management necessitates that Fort Belvoir continue to (1) obtain and use the best available scientific information; (2) employ a skilled and professionally trained natural resource staff, that are experienced in all areas of natural resources

management, and that are authorized to make sound professional judgments and decisions regarding resource management; and, (3) coordinate with natural resource professionals within the regulatory, scientific and resource-user communities to obtain the best available information on regulatory requirements, conservation initiatives, and implementation technologies.

Fort Belvoir strives to establish natural resources management goals and objectives that are appropriate for the ecological setting, and that are consistent with its military mission. The installation monitors the success of the program through field surveys and monitoring projects and makes corrective actions as necessary using adaptive management techniques.

In keeping with the "regional" ecosystem management approach to natural resources, Fort Belvoir is a partner in two regional programs, the Chesapeake Bay Program and the Partners in Flight Program. The focus of the Chesapeake Bay Program is to restore and protect the Chesapeake Bay and its living resources. Fort Belvoir is an active program participant due to its location along the Potomac River. Additionally, Fort Belvoir participates in the Partners in Flight Program and is currently participating in the formulation of the Mid-Atlantic Coastal Plain Bird Conservation Plan, which takes a regional approach to habitat protection of certain priority bird species. Fort Belvoir has elected to use some of the Partners in Flight priority bird species as indicator species for wildlife management (Section 11).

Fort Belvoir's natural resources management program is "*fully integrated*" among the component natural resources disciplines (e.g., water, vegetation, wetlands, wildlife, etc.). Consequently, implementation of management actions is not necessarily discipline-specific. However, to facilitate the presentation of its natural resources management program in this INRMP, Fort Belvoir's natural resources management program is defined and described in terms of seven major subject areas.

- Section 7 - Water Resources, to include watersheds, aquatic systems, and fish
- Section 8 - Wetlands
- Section 9 - Undeveloped Areas Vegetation, to include native vegetation communities and forests
- Section 10 - Developed Areas Vegetation, to include landscaping, urban tree maintenance, grounds maintenance, and pest management
- Section 11 - Wildlife
- Section 12 - Endangered, Threatened, and Rare Species and Communities
- Section 13, Special Natural Areas to include the installation refuges and the Forest and Wildlife Corridor

Because many of the major management initiatives (e.g., watershed conservation and restoration, integrated pest management) address multiple disciplines, redundancy among the document sections is unavoidable.